

THE PHYSIOLOGIST AS ARTIST

DISCOVERIES OF CLAUDE BERNARD

CLAUDE BERNARD, Physiologist. By J. M. D. OLMSTED. Cassell. 15s.

Claude Bernard was a contemporary of Pasteur, and, from 1870 to the end of the last century, his name and work were constantly in the mind of every serious student of medicine.

Towards the end of last century Sir Michael Foster produced a very interesting biography of Bernard; but, compared with the present volume, it was cursory. Dr. Olmsted, writing nearly half a century later, is in a better position to gauge the fundamental importance of Bernard's work in the light of the further knowledge that has grown directly out of it. It is to Claude Bernard, more probably than to anyone else, that we owe the knowledge which enables us to treat diabetes with such great relative success. For it was he who, by patient experiment, unravelled or, at any rate, made the first great advance in that unravelling of the mystery of sugar metabolism within the body. It was he who discovered the glycogenic function of the liver, having first proved that cane sugar injected into the veins of an animal was excreted by the kidneys unchanged, and, therefore, was not utilized by the body. He inferred therefrom that there must be some substance or organ in the body which in health so transforms the sugar we eat, and the sugar into which starch is converted in the process of digestion, as to make it usable by the tissues.

The problem, thus more than half solved, was narrowed, and the subsequent discovery of insulin was one of the results. To Bernard also we owe a great part of our knowledge of the part played by the pancreatic juice in digestion. But perhaps our chief debt to him

is the foundation-stone which he laid down of a new scientific medicine based on a true physiology.

Bernard stressed the importance of physiology as a distinct branch of science—a science concerned with vital phenomena as distinguished from the chemical and physical happenings that may be observed in non-living substances. In "La Science Expérimentale," published in 1878, he wrote:—

La physiologie générale, par son objet, se confond avec toutes les sciences des êtres vivants, puisqu'elle analyse des phénomènes qui se passent à la fois dans l'homme, dans les animaux et dans les végétaux. Elle n'en est pas moins cependant une science distincte, parce qu'elle poursuit un problème spécial qui détermine son domaine propre.

He had said much the same in a contribution on the progress of general physiology in France which he had made to a symposium eleven years earlier. In that contribution he used a term which has shown itself to be pregnant with significance, *le milieu intérieur*.

Earlier still, in 1860, Bernard had expounded in his lectures the truth that we and other complex living beings have really two environments, an external one which we share with every other object on earth, and an internal one with which alone the living particles of our bodies are in contact, in which they have their true being. In us, he said, the totality of the circulating fluids may be regarded as constitution, the internal environment—*le milieu intérieur*. He showed how constant is the internal environment and how necessary this constancy is to our life and health. In winter and summer, in the

Arctic regions and in the tropics, in health and disease, the temperature of the blood while we are alive varies but by a few degrees. So, likewise, with the blood's salinity, with its specific gravity, with its alkalinity. "It is the fixity of *le milieu intérieur* which is the condition of free and independent life; and all the vital mechanisms, however varied they may be, have only one object, that of preserving constant the conditions of life in the internal environment"—a sentence characterized by the late Dr. J. S. Haldane as "the most pregnant ever framed by a physiologist."

From all this it is clear that Claude Bernard was not only a scientist in the narrower meaning of the word but also a philosopher with many of the qualities of an artist. It is interesting that, before he took to physiology or medicine as a subject for his inquiring mind, he sought fame as a dramatic author. Fortunately, his first play was not successful—for his contribution to the understanding of ourselves is worth many plays. He exercised, however, an important influence on the French novel through Zola, who made his theories the basis of his family-history of the "Rougon-Macquarts." He was always a realist; and to all theories he adopted a pragmatist attitude: "Does it work?" Why think, when you can experiment?" was one of his aphorisms.

The chief interest of the biography of a man like Claude Bernard naturally lies in the record of his scientific work and in the bearing of that work on subsequent events. Rightly, therefore, the account of his scientific work takes up the greater part of Dr. Olmsted's admirable book. But he does not forget to tell us relevant and interesting things about Bernard's youth and about his personal and domestic life.

A review of "Mahatma Gandhi," edited by S. Radhakrishnan, appears on page 589.

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the autobiography of Dr. Ritson, for more than thirty years one of the secretaries of the British and Foreign Bible Society, cannot but be of interest to many people. It is the record of an active, full, and varied life, spent partly in the service of a great Church and partly in that of a great Society. Methodism and the Bible Society have had equally the devotion of Dr. Ritson's heart—his autobiography is the revelation of a powerful personality consecrated to the service of both.

Before he became secretary of the Bible Society Dr. Ritson was a Methodist pastor in active work and a tutor and examiner in Methodist colleges; during his long years of secretarial service he continued to take part in the executive work of the Methodist Church and was in 1924 elected president of the Wesleyan Methodist Conference for 1925; after his retirement from his secretaryship in 1931 he continued to serve Methodism as a minister without pastoral charge. But it is the Bible Society that had the central years of his life and the fullness of his energy; and so while Methodism furnishes the personal background of Dr. Ritson's life, it is his long secretaryship that fills the greater part of his story and comes into view as the principal work of his life.

In the discharge of his duty Dr. Ritson not only worked in London, but also travelled much; and visits to Canada, the South Seas, South Africa, Western Europe, the Balkans, Russia, China, and Japan are described, and add no little to the general interest of the autobiography. He met many famous men in the course of his career—monarchs, noblemen, bishops, industrialists all appear in his pages. At the same time the humbler folk who serve the Bible Society are not forgotten: agents, colporteurs and lady collectors all have their meed of praise. We obtain the picture of a master of affairs, energetically controlling a great organism, taking delight in his work, spending and being spent in Christian service.

home town at a private school, a board school, and a Wesleyan school. Then in 1879, winning an exhibition open to elementary school boys between eleven and thirteen, he proceeded to Manchester Grammar School, where he presently became head boy on the science side. Here he was awarded a closed scholarship tenable at Oxford; and he was successful in adding to this an open scholarship at Balliol. Thus it was that in 1886 he began residence in Oxford. Benjamin Jowett was then Master of Balliol and Sir John Conroy tutor in natural science. J. H. Ritson's Oxford career ended with a first class in the latter subject. At this point, however, he decided to become a Methodist minister and Jowett encouraged him in the project.

Oxford comes into the story of his life again, when in 1926 the University gave Ritson a D.D. degree. This commemorated the bicentenary of John Wesley's admission to a Fellowship at Lincoln College by an honour bestowed on his successor in the Chair of Conference. The Public Orator noted that Ritson was the first Oxford man to occupy the Chair after Wesley himself.

One of the most interesting things in Dr. Ritson's autobiography is the *apologia pro vita sua* which he offers at its close. He had previously recounted how a business man had said that it was a pity to abandon the ministry to sell tenpenny Bibles. Now he admits that he has spent the greater part of his life "serving tables," but he contends that such work has never been inconsistent with the direct spiritual calling of the Christian ministry, but has rather been part of it. He recalls a fishing expedition at Fowey, when he rowed the boat and his four children held the baited lines. He then felt that he was an essential part of the expedition, and he shared in the joy of the "catch," which he had not himself made. So has it been with the chief work of his life. He has been a helper of the fishers of men. The Bible is the necessary implement of the Christian minister and missionary. To provide it is a sacred mission worthy of any man's devotion.

had never been so neat; herbaceous borders had never been so well planted; and he was excellent at winning prizes for himself at flower shows, with half a dozen roses, or a few great vegetables. But he cared nothing for planting trees.

THE ILLUSTRATIONS

Mr. Noyes also writes of the Isle of Wight as a whole and has a chapter on the painters and writers who found shelter in this island; "memories of Tennyson, Keats and Swinburne once led a contemporary critic to describe the Isle of Wight as the English Parnassus." But there were also Longfellow, who wrote an inscription for a fountain at Shanklin, Turgenev, who began "Fathers and Sons" in the island—"good judges have described it as a great book, but to me its characters—as in most Russian novels—all seem to be slightly mad"—and Sydney Dobell, "a poet who will one day be rediscovered." Alice Meynell, in early life, lived at Steephill, "and was inspired to make a parable of a garden by the sea, in perhaps the loveliest of her early sonnets." Unfortunately it was not in the Isle of Wight that a yet more illustrious visitor appeared to her.

She told me that once, when she had been playing there alone, she felt that Beethoven was in the room. She had stopped immediately, and turned to look at the window where she thought he had been standing. There was no one to be seen, but a bunch of flowers had been dropped by an unseen hand.

Mr. Noyes mixes his prose with a considerable number of poems which come in appropriately and gracefully to illustrate his points. In his more prosaic passages he is not always entirely accurate; he writes of "Lord Bacon," and mentions "a genus which Linnaeus christened *tectorum*." This presumably refers to *Sempervivum tectorum*, but in any event it must have been a species, not a genus, which Linnaeus so christened.

Professor Stephen H. Roberts's study of Nazi Germany, "The House that Hitler Built," has now been published in a new, cheaper edition. (Methuen. 5s.)



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